



# Australia's National Resources Workforce Strategy

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# **Australia's National Resources Workforce Strategy**

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# Foreword

**Australia's National Resources Workforce Strategy provides a forward-looking plan to help connect people with the skills and opportunities needed for a rewarding career in the sector.**

The resources sector makes up over half of Australia's exports, and has long employed a large number of Australians in both regions and cities. We are a world leading supplier of energy and other commodities — essential inputs for construction, cars, wind turbines, smart phones and many other modern technologies. It is no surprise then that the forecast for growth and job creation in the sector remains strong, despite a year characterised by hardship and disruption.

The sector provides diverse career pathways. Resources is one of our largest regional employers, supported by laboratories, operations centres and offices across Australia — and around the world. The sector is constantly changing, innovating and using the latest cutting-edge technology, such as artificial intelligence, robotics and big data. Our competitive edge relies on bringing together a breadth of skills and expertise, alongside a commitment to being the best.

Australia is well placed in this regard — home to world-class education and training, including for example digital, engineering, science and trades. The Government believes that all Australians should have access to training and education to prepare for employment. Particularly where jobs are regional, we want to ensure that people living in regional communities can enrol in relevant training

and continue to upskill. Our incentives and student support help to prepare Australians to join the country's highest paying industry, and to gain skills and experience that are highly sought after across industries and internationally.

The Strategy draws together the Government's commitment to education reform, skills packages and job support that will help all Australians to pursue careers in the resources sector. Working together with state and territory governments, industry and academia, we will ensure that the resources sector continues to grow, support the economy and provide long-term, rewarding careers to Australians.

**The Hon. Keith Pitt MP**

*Minister for Resources, Water  
and Northern Australia*



# A Strategy to Secure the Resources Workforce

Australia's resources sector makes up more than half of Australia's total exports and around 10 per cent of Australia's GDP. Employment across the sector has remained fairly stable over the past year, and commodities such as gold and iron ore have buoyed our economy during a difficult year. Resources and energy commodities are forecast to remain an important contributor to the Australian economy as it recovers from the economic impact of COVID-19. To support the sector, the Government is investing in growth and modernisation, which will make Australia more competitive and create more jobs into the future.

The resources sector provides over 260,000 highly paid jobs across Australia. Despite strong predicted growth and high wages, both enrolments and completions in resources related education and training have significantly decreased. For example, between 2015 and 2019, completions in mining engineering, geological sciences and VET drilling or plant operations declined by between 49 and 70 per cent. These are core skills that underpin operations for the resources sector.

In addition to these traditional vocations, the sector increasingly needs new skills, especially in science, technology, engineering and mathematics (STEM) fields, driven by the uptake of new technologies and the development of methods to bring new commodities like hydrogen and critical minerals to the market.

The COVID-19 pandemic has strengthened the Government's focus on supporting existing jobs and creating more. The Strategy outlines the actions Government is taking to address industry trends, promote opportunities and prepare Australians to take up jobs in the sector.



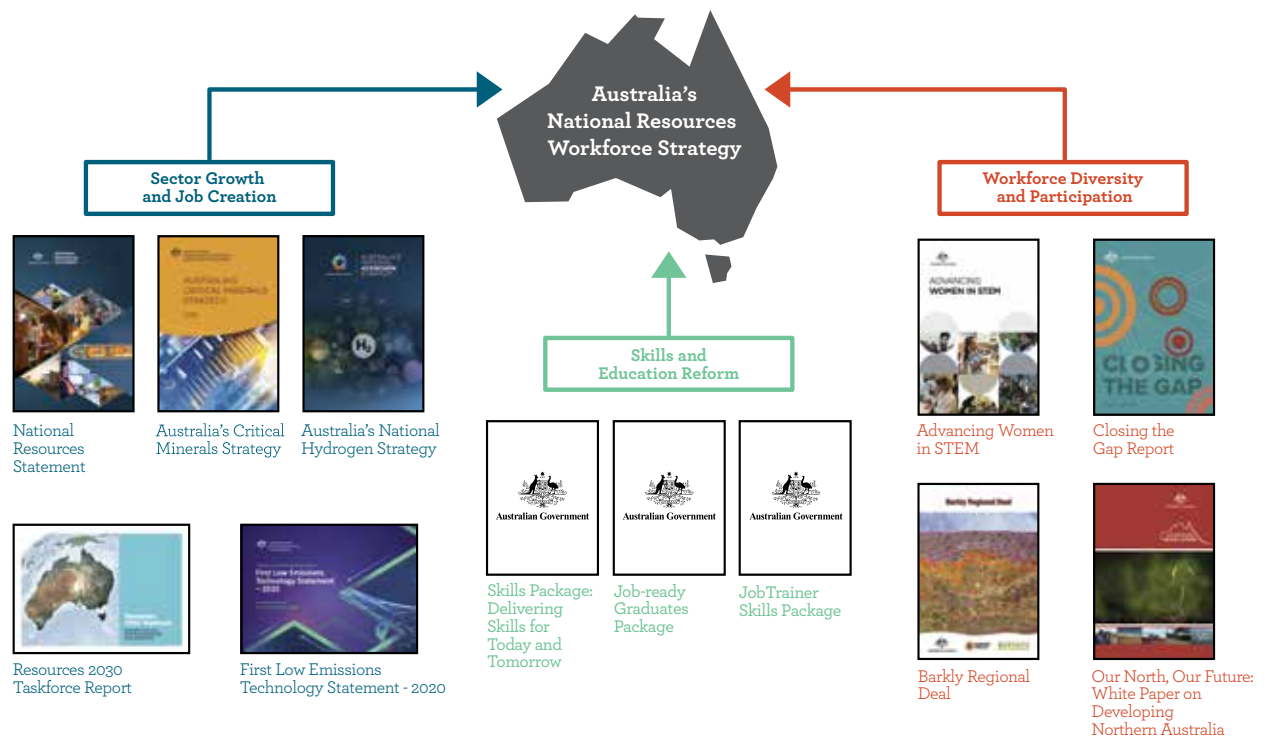


Figure 1. A strategy that builds on Government priorities.

*Australia's National Resources Workforce Strategy brings together relevant Government programs under three themes to shape the workforce of the future — opportunity, participation and quality education.*

## Opportunity

As the sector evolves and expands into new commodities, the Government is supporting the sector to innovate, be competitive and create more, diverse jobs that are safer and more rewarding.

## Participation

The Government is providing a range of programs to encourage and support Australians to take up these jobs and relevant education and training, in particular by those living in regional areas, women, and Aboriginal and Torres Strait Islander peoples.

## Quality

The Government is pursuing significant skills and education reform to support stronger outcomes for industry, greater flexibility for students, and to provide Australians with more robust skillsets that are highly attractive to employers.

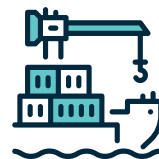


# Workforce Snapshot

The resources sector offers a diverse number of careers throughout the lifecycle of a project. These careers are located across Australia, in both regional and metropolitan areas in all states and territories. Occupations require different qualifications and skill levels, and many are transferable across industries, allowing for career flexibility. While traditional resources occupations are still in demand, a number of new skillsets are also increasing in demand.



SUPPORTING  
**1,100,000**  
JOBS



**261,800**

DIRECTLY EMPLOYED BY  
RESOURCES BUSINESSES



**300,000**

DIRECTLY EMPLOYED BY MINING  
EQUIPMENT, TECHNOLOGY AND  
SERVICES BUSINESSES








**+20,000**

JOBS GAINED ACROSS THE  
SECTOR DURING COVID-19  
(FEBRUARY-NOVEMBER 2020)



## CAREER OPPORTUNITIES THROUGHOUT THE RESOURCES PROJECT LIFECYCLE

PROJECT PHASE	EXAMPLE CAREERS		A CLOSER LOOK		
 EXPLORATION	GEOLOGIST	MINING ENGINEER	<b>GEOLOGISTS, GEOPHYSICIST, HYDROLOGISTS</b> Weekly wage: \$2,192 Skill: Very Highly Skilled Projected growth: Moderate Number of employees: 6,300	<b>MINING ENGINEER</b> Weekly wage: \$3,118 Skill: Very High Projected growth: Strong Number of employees: 7,800	
	FINANCE	HYDROLOGIST			
	BUSINESS MANAGER	ENVIRONMENTAL SCIENTIST			
 CONSTRUCTION & COMMISSIONING	SURVEYOR PROJECT MANAGER		<b>STRUCTURAL AND WELDING TRADES WORKERS</b> Weekly wage: \$1,541 Skill: Medium Projected growth: Moderate Number of employees: 7,800	<b>METAL FITTERS AND MACHINISTS</b> Weekly wage: \$2,062 Skill: Medium Projected growth: Moderate Number of employees: 22,700	
	TRADES	CARPENTER			EXCAVATORS
		ELECTRICIAN			WELDERS
		BUILDER			
 OPERATIONS & MAINTENANCE	DRILLERS	MINING ENGINEER	<b>DRILLERS, MINERS, SHOT FIRERS</b> Weekly wage: \$2,500 Skill: Lower Projected growth: Strong Number of employees: 50,200	<b>MECHANICAL ENGINEER</b> Weekly wage: \$2,414 Skill: Very high Projected growth: Stable Number of employees: 3,200	
	SHOT FIRERS	CHEMICAL ENGINEER			
	LOGISTICS	MECHANICAL ENGINEER			
	PROCUREMENT	SOFTWARE ENGINEER	<b>PRODUCTION MANAGER</b> Weekly wage: \$2,258 Skill: Very High Projected growth: Stable Number of employees: 8,400	<b>CHEMICAL AND MATERIAL ENGINEER</b> Weekly wage: \$3,019 Skill: Very High Projected growth: Moderate Number of employees: 800	
	DATA SCIENTIST				
 DECOMMISSIONING	COMPUTER SCIENTIST	PROJECT MANAGERS	<b>EARTHMOVING PLANT OPERATOR</b> Weekly wage: \$1,491 Skill: Lower Projected growth: Moderate Number of employees: 6,100	<b>ELECTRICIAN</b> Weekly wage: \$1,823 Skill: Medium Projected growth: Moderate Number of employees: 9,800	
	ELECTRICIANS	MECHANICS			
 REHABILITATION	EARTH SCIENTIST	WATER SPECIALIST	<b>ENVIRONMENTAL ENGINEER</b> Weekly wage: \$2,155 Skill: Very high Projected growth: Very strong Number of employees: 400	<b>EARTH SCIENCE TECHNICIANS</b> Weekly wage: \$1,500 Skill: High Projected growth: Stable Number of employees: 1,100	
	ENVIRONMENTAL ENGINEER	LABORATORY ASSISTANT			
	PLANNING OFFICER				

\*PROJECTED GROWTH RELATES TO 2019



# Strategic Outcomes

## Improving opportunities, participation and quality

The Strategy links a range of programs being led across Government, the resources sector, and education providers to meet industry needs and support Australians to start or continue a rewarding resources career. It identifies a series of outcomes under these three themes that will be delivered by the Government in partnership with industry and the education and training providers to seize opportunities, boost workforce participation, and improve education outcomes to meet the skills needs of the future.

### OPPORTUNITY

**Supporting growth and modernisation in the sector to make Australia more competitive, create more jobs, and increase the diversity of career opportunities.**

#### Action Items:

1. Support sector growth, productivity and job creation through Government initiatives including the National Resources Statement and industrial relations reforms.
2. \$6 million for Industry 4.0 Testlabs for Australia pilot program to develop workforce skills needed to take full advantage of opportunities presented by Industry 4.0 technologies.
3. Undertake an industry workforce study with the Australian Resources and Energy Group to understand future occupational and skills demand in the sector to inform future policy and workforce planning.

## PARTICIPATION

### Increasing Australian participation and representation in the resources sector.

#### Action Items:

4. Support Australian participation and local employment practices, particularly in regional resources communities, including by:
  - a. Developing a set of industry principles with the Minerals Council of Australia that promote a best-practice industry approach to local, regional and Australian employment and procurement practices.
  - b. Examining local employment opportunities and specific regional challenges as part of Strategic Basin Planning (\$28.3 million) and future regional deals, modelled on the \$78.4 million Barkly Regional Deal.
5. Attract skilled migrants who make a significant contribution to the Australian resources sector, and fill positions where no Australian workers are available.
6. Provide opportunities, particularly for women and Aboriginal and Torres Strait Islander peoples, to engage with resources careers.
  - a. Promote STEM study to female students in resource-rich regions, and raise profile of women leaders in resources careers as part of the \$14.5 million to extend Women in STEM programs, and in conjunction with the Women in STEM Ambassador.
  - b. Boost participation and retention of Aboriginal and Torres Strait Islander peoples in resources careers (\$68 million through the Indigenous Advancement Strategy, \$30 million Indigenous STEM Education Project).

## QUALITY

### Ensuring that education and training systems produce cutting-edge outcomes that support industry needs and prepare workers for jobs into the future.

#### Action Items:

7. Boost student uptake of STEM related subjects at school by supporting students and connecting school leavers with higher resources-related studies and career pathways.
8. Increase the accessibility and availability of resources-specific tertiary courses, especially in resources regions, to boost the pipeline of talented, job-ready graduates, including through \$30 million to establish the new School of Mining and Manufacturing at the Central Queensland University.
9. Work with the Australasian Institute of Mining and Metallurgy to understand factors influencing youth decision-making regarding pursuing careers in the resources sector.
10. Shape the resources VET training system to become more responsive to changing skills needs of the resources sector through the Mining Skills Organisation Pilot and broader reforms as part of the \$585.3 million Delivering Skills for Today and Tomorrow package.
11. Create additional industry-education partnerships for the resources sector and increase the availability of Work Experience in Industry placements through the \$900 million National Priorities Industry Linkage Fund.
12. Facilitate upskilling, reskilling and cross-skilling through resources-related short courses and microcredentials, including with a \$4.3 million national online microcredentials marketplace.



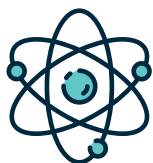
# Opportunity

**Supporting growth and modernisation in the sector to make Australia more competitive, create more jobs, and increase the diversity of career opportunities.**

New career opportunities are prevalent in the resources industry — and the demand for workers is growing. While COVID-19 has impacted many sectors, the resources sector has shown resilience and relatively strong growth, which is predicted to continue. Wages, career opportunities, industrial relations, and stringent health and safety requirements in the Australian resources sector are amongst the best in the world. Australian resources are of a high quality and are in global demand, which will continue to create opportunities for Australians.

The demand for new and emerging skills is also on the rise, driven by the uptake of new technologies and emerging sectors like critical minerals and hydrogen. The integration of technologies is creating a range of different jobs in the resources sector.

The Government is committed to supporting this growth and modernisation in the sector to make Australia more competitive, create more jobs, and increase the diversity of career opportunities. The Government is pursuing a range of initiatives in the sector to support growth, identify opportunities and improve conditions, including through enhancing technologies.



**\$500 MILLION**

COMMITTED TO NEW  
HYDROGEN OPPORTUNITIES



**\$156 MILLION**

INVESTED IN CARBON  
CAPTURE STORAGE  
TECHNOLOGY



**\$60 MILLION**

OVER \$60M INVESTED IN  
CRITICAL MINERALS



## A growing sector that's creating jobs

Global demand for Australian resources, including iron ore and gold, is supporting the Australian economy, creating jobs and providing greater job certainty for those already in the industry. There is a rising demand for university and TAFE qualifications such as drilling and surveying and for specialists in structural geology, metallurgical engineering, geo-statistics, hydrologists and rail engineering.

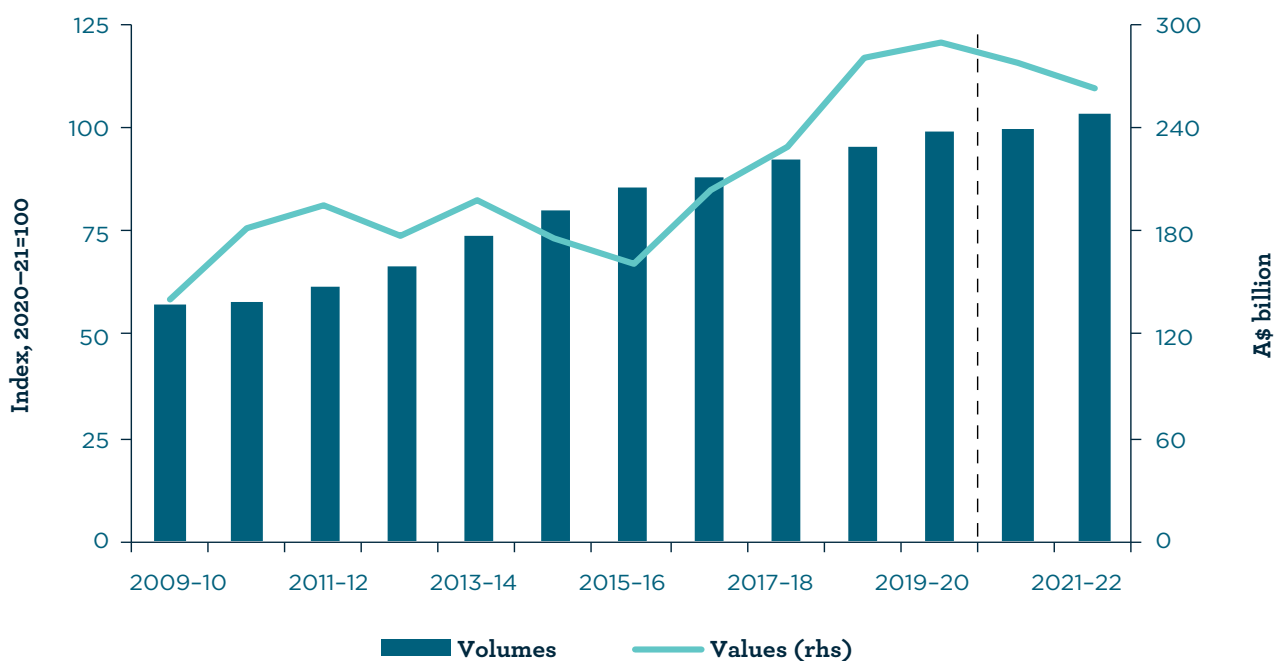
Prior to COVID-19, strong job growth was forecast with 15,400 new jobs (6.2 per cent) expected in the sector by May 2024. Despite the global impact of COVID-19, in November 2020, total employment in the mining sector increased, up 8.5 per cent from February 2020. The Government is supporting this growth through the National Resources Statement — a statement outlining actions to achieve the world's most advanced, innovative and successful resources sector which delivers prosperity to all Australians. One such action includes the \$225 million Exploring for the Future initiative that is dedicated to exploring Australia's resource potential and boosting investment.

As the sector grows, new jobs will be created.

The Government is supporting Australia's growth into new markets, including by implementing *Australia's Technology Investment Roadmap*, *Australia's Critical Minerals Strategy* and *Australia's National Hydrogen Strategy*.

The Government is ensuring that industrial relations and employment conditions continue to support business growth and job creation across Australia. This includes effective and fair industrial relations arrangements for employers and employees, while incorporating and adapting to the changing work practices resulting from the industry's increased adoption of advanced technologies. The Government established a number of dedicated working groups on industrial relations reform with members representing industry, employees and their representatives. One of these groups examined changes to the greenfields agreements that would provide certainty to business and support investment in job-creating major projects. Other groups assessed casual and fixed-term employment, award simplification, enterprise agreement making, and compliance and enforcement.

## Australia's resource and energy export values/volumes





## Technology — changing the resources workplace

New technologies are ensuring the Australian resources sector remains productive and internationally competitive. Technologies, such as robotics, automation, GPS technologies and big data, are being incorporated throughout resources project lifecycles and across the mining equipment, technology and services (METS) sector. Prior to COVID-19, the uptake of these technologies was projected to further contribute to job creation with up to 80,000 new jobs across the METS sector by 2030, and create an economic impact of over \$52 billion.

As well as increasing efficiency, improving environmental management, and providing additional job opportunities, technology is changing the workplace and improving the health

and safety of workers. For example, remote operating centres offsite from mining projects increase worker safety, as they provide direct connectivity to mines without the need to be on site. The Government and community expectations hold industry to the highest safety standards. Safety is critical in maintaining effective and reliable operations, as well as supporting workers and communities, and attracting new employees.

The Government is promoting ways for employers and educators to test and understand the practical workplace impacts that different technologies have in the workplace, and test which skills are needed to support them. For example, the Government has allocated \$6 million to the Industry 4.0 Testlabs pilot program, including a gas-focused testlab in WA, to understand and test the practicalities of different digital technologies.

## Send in the drones

Brisbane-based company Emesent, a spin-out from the Commonwealth Scientific and Industrial Research Organisation (CSIRO), specialises in drone autonomy, LiDAR mapping, and data analytics. Their flagship product, Hovermap, is smart mobile scanning unit that automates the collection and analysis of data in challenging, inaccessible environments, such as underground mines.

Data collection creates significant safety and operational challenges in underground mines. People and equipment are regularly sent into hazardous areas, which poses a significant risk to their safety. Hovermap enables a drone to navigate into these areas to map them, keeping personnel away from danger and improving the quality of data collected to unlock new insights.



## Diverse career opportunities

Technology is contributing to the diversity of jobs available, and the different skillsets that industry needs. The resources sector is no longer just hard hats and high-vis vests, it also includes careers in environmental science, engineering, finance, chemistry, public relations, information technology, health and safety, geology and human resources. These roles are spread across metropolitan and regional areas. In 2019, Ernst and Young published *The Future of Work: Changing Skills Landscape for Miners*. The report mapped the impact of digital technologies on the resources workforce across all segments of the supply-chain and the changing demand for specific workforce skills. These changes are driving the creation of new, well-paid specialist occupations, such as data scientists and mechatronic engineers.

Changing labour market conditions are creating demand for additional skills across existing resources sector occupations. These include: creativity, change management, data analysis, digital literacy, design thinking, stakeholder analysis, active listening and learning, as well as strategic planning.

To better understand and quantify this future demand, the Australian Resources and Energy Group is undertaking regular forecasting studies to map the expected growth in the national resources workforce, including specific occupations where shortages may emerge. This will inform Government, the education sector, and industry to help understand and develop policy, skills and workforce planning strategies.







# Participation

## Increasing Australian participation and representation in the resources sector.

The Government is committed to supporting Australians to take-up the increasing number of highly paid jobs in the resources sector. The sector needs workers to operate, thrive and support the economy. At the same time, getting Australians into jobs provides economic stability and resilience for individuals and communities. Where this is not possible, skilled migration ensures that the sector has the expertise necessary to continue operating.

With an increasing number of opportunities on offer, and a focus on training and education improvements, the Government is pursuing a range of initiatives to boost participation by Australians. All Australians, whether female, Indigenous, regional or city based, can access support, training or education to start a career in resources.



**51%**

OF RESOURCES EMPLOYEES  
RESIDE IN NON-METRO AREAS



**3.7%**

OF PEOPLE EMPLOYED IN  
THE RESOURCES INDUSTRY  
ARE ABORIGINAL AND  
TORRES STRAIT ISLANDER



**\$2,697.50**

EMPLOYEES IN THE  
RESOURCES SECTOR HAVE THE  
HIGHEST AVERAGE WEEKLY  
EARNINGS IN AUSTRALIA

## Jobs for Australians

Approximately half of workers in the resources sector are based in metropolitan areas, and the other half in rural and regional areas of Australia. The resources sector offers highly paid, rewarding and exciting opportunities across Australia with an average wage that is 57 per cent higher than other industries.

The Government is working with industry, education and state and territory governments to continue to maximise opportunities for all Australians in the resources sector. As a significant employer of regional Australians, the resources sector and the METS sector provide substantial support to communities through the provision of skill development and training, thereby opening up opportunities for long-term employment. This is why the Government will support the Minerals Council of Australia's efforts in working with the industry to promote Australian employment and local procurement.

## Jobs for the regions

It is essential that regional communities benefit from the development of local resources projects in the long-term. Resources development supports regional communities through procurement from local businesses, supply chains and investments in local infrastructure. These jobs are the lifeblood of many communities and underpin the resilience of regional economies.

The Government is partnering with BHP to create opportunities for those in regional areas through the Future of Work Partnership. The program will provide opportunities for up to 1000 people over the next five years in regional areas to receive skills and training to help support healthy, diverse local economies. Through the BHP partnership, Australians will become more job-ready by gaining qualifications through short courses, or participating in workplace integrated learning through an Advanced Apprenticeship.

The Government is working to maximise economic diversification and resilience for the regions through regional deals and opening new basins. Regional deals bring together all levels of government around a clear set of objectives.

For example, the Barkly Regional Deal between the Australian Government, the Northern Territory Government and the Barkly Regional Council includes the development of a Regional Workforce Plan to identify and align training and employment opportunities and maximise local and Indigenous employment. The Government is also developing five new strategic basin plans, starting with the Beetaloo basin in the Northern Territory, and the Galilee and North Bowen basin in central Queensland. These plans will consider how to maximise the benefits to local communities, including through employment, procurement and increased economic activity in the regions.

Additionally, the next phase of economic development under the Australian Government's Our North, Our Future: White Paper on Developing Northern Australia will drive economic growth in northern communities through job creation and support for initiatives that encourage workforce participation.

## Fly-in fly-out

Where local workers are not available, Fly-In Fly-Out (FIFO) job opportunities provide ways for workers across Australia to access well-paid, rewarding jobs through flexible working arrangements. FIFO also provides ways for people to try a new job without committing to immediate relocation. FIFO jobs provide industry with options to fill short-term gaps in peak periods.

The Government is committed to ensuring that positive FIFO work practices exist to support workers, while supporting local communities. In the long-term, an overreliance on FIFO employees can have negative impacts on local communities when not managed properly. Different jurisdictions are taking steps to improve FIFO practices, for example Queensland prohibits a 100 per cent FIFO workforce for large mining projects.

The COVID-19 pandemic has changed how resources companies use FIFO. State and international border closures have led to policies that encourage FIFO workers to relocate. Western Australia announced new incentives to entice FIFO workers to relocate permanently during the pandemic, including access to the State Government's \$20,000 Building Bonus grant.

## Supporting women in resources

Women represent just 16.9 per cent of the resources workforce. This underrepresentation means that industry is losing out on a large part of the workforce. Increasing female participation improves Australia's productivity and prosperity; increasing the bottom line of businesses and boosting Australia's GDP. The sector must do better to attract female workers to address skill shortages and reverse declining enrolments.

The Government is working to remove barriers, break down gender stereotypes and create an inclusive workforce by working with industry to attract women into the resources sector, particularly in STEM fields, for example through the Women in STEM Ambassador program and awareness campaigns.

The Government has committed \$1.5 million to support 'Future You', a national digital awareness raising initiative from 2019–2022. Led by the Women in STEM Ambassador, the initiative aims to break down gender stereotypes and increase awareness of the kinds of careers STEM skills can lead to. The campaign includes a range of characters with interactive games that teach about different occupations and STEM skills, including the opportunities that the resources sector offers.

The sector runs a range of programs to support women to pursue careers and leadership roles in the sector. For example:

- The Australasian Institute of Mining and Metallurgy's *Women in Mining* project works to empower women in the industry and encourage advancement. The program is aimed at women working in the resources sector at any experience level. It organises events, professional development and mentoring for women in the resources sector.
- BHP set a goal to achieve gender balance by 2025. In 2016, BHP reflected the national average with women comprising 17.6 per cent. By 2019, this figure improved to almost 25 per cent, adding over 2000 women to its workforce. Ensuring women remain in the workforce has led to a reassessment of workplace culture and more consistent application of inclusive and appropriate work practices across the organisation.





## Aboriginal and Torres Strait Islander peoples

The Government is working to increase career and training opportunities for Aboriginal and Torres Strait Islander peoples, particularly in regional and remote areas. The resources sector is a strong employer of Indigenous Australians, comprising 3.7 per cent of the current workforce. This is above the national average of 1.7 per cent, with the Indigenous population making up roughly 3 per cent of Australia's population.

The Australian Government works with industry to improve career opportunities for Indigenous Australians through Commonwealth and jurisdictional investment. The Indigenous Advancement Strategy provides support for Indigenous Australians to address work readiness, learn new skills and provide mentoring to support people commencing employment. Programs span across all of Australia, including regional, rural and remote areas, and support individuals into a range of industries, including the resources sector. Since the commencement of the Indigenous Advancement Strategy in 2014, over 52,000 Indigenous Australians have received support to commence employment, undertake cadetships or school-based traineeships.

The Government is working with industry to increase participation of Indigenous Australians in STEM education. The \$30 million Indigenous STEM Education Project is a six-year project funded by the BHP Foundation and implemented by CSIRO. The project is working with primary, secondary and tertiary students in remote, regional and metropolitan areas, including mining-rich areas like the Western Goldfields to engage students in STEM studies and support Indigenous students to pursue university studies. Since 2015, over 22,116 Aboriginal and Torres Strait Islander students, 233 schools, 2,141 teachers and assistant teachers and 23 remote communities have been engaged in the program.

### Skilled migration as a stop-gap

When Australian workers are not available, or not suitably skilled, migration provides a mechanism to meet industry needs, fill gaps, and deliver economic value. Skilled migrants can also help to grow Australian expertise and skillsets. The Government, through the National Skills Commission, maintain lists of skilled occupations that are in demand

and eligible for skilled migration. These lists are reviewed regularly based on labour market analysis as well as industry and stakeholder consultation. With the impacts of COVID-19 on migration and international travel, the Government has prioritised certain occupations relevant to the resources sector which are important for the recovery of the Australian economy.



# Quality

**Ensuring that education and training systems produce cutting-edge outcomes that support industry needs and prepare workers for jobs into the future.**

Australians need to have the required skills and training to take up jobs, meet industry needs, and drive productivity for the sector. Australia is a leading education provider, with globally renowned education and training on offer, especially in resources-related courses.

Skills needs are changing. An estimated 77 per cent of Australian mining jobs will be enhanced or redesigned due to technology within the next five years.

Government, industry and academia are working together to align course materials to industry skills needs — actively shaping, iterating and modernising course curricula. The Government is also supporting workers to undertake additional training to meet these changes.



**35%**

OF THOSE EMPLOYED  
IN THE INDUSTRY HAVE  
A VET QUALIFICATION



**4 OUT OF 5**

OF THE WORLD'S TOP  
UNIVERSITIES FOR  
MINING ENGINEERING  
ARE IN AUSTRALIA



**24%**

HAVE A BACHELOR'S  
DEGREE OR HIGHER

## STEM as a foundation

STEM skills underpin a variety of roles in the resources sector, both traditional and emerging. They are fundamental for new jobs being created by technology. STEM skills fuel innovation, leading to new discoveries, products and technologies that ensure Australia remains a world leader in the resources sector.

Science, technology, engineering and mathematics (STEM) subjects provide a foundation for many highly paid and in-demand careers. Modelling by the National Skills Commission shows that jobs in STEM-related occupations grew by 12.7 per cent over the five years to May 2020, or 5.7 times higher than the growth rate in non-STEM jobs (2.2 per cent), with 73 per cent of STEM occupations requiring a Bachelor Degree or above qualification.

It is important to provide all Australians with opportunities and support to build STEM skills that will lead to long and prosperous careers. This starts in schools and continues through to higher education and on-the-job learning. For example, the STEM Professionals in Schools, Little Scientist program and Curious Minds (STEM Summer School for Girls) are initiatives that support student participation in STEM-related activities. The Government is also reducing the cost of STEM

subjects in universities. By choosing to study in areas of national priority such as STEM, student loans and the time it will take for students to pay back a Higher Education Loan Program is predicted to decrease depending on the field of study.

Government, industry and academia are working together to generate more highly-skilled STEM graduates and connect students with resources-related pathways. The Bright Future STEM program, delivered by the Australian Resources and Energy Group, is a national program that engages 9-12 year old students in STEM energy and resources industry experiences and breaks down stereotypes of traditionally male-dominated industries by featuring female role models. Additionally, the Queensland Minerals and Energy Academy is Australia's largest industry-led school partnership between the Queensland Resources Council (QRC) and the Queensland Government under the Gateway to Industry Schools program. Designed to provide a talent pipeline of employees into VET and STEM-related resources careers, the Academy broadens student and teacher knowledge of the resources sector and its career pathways. Supported by 25 companies and the broader QRC membership, the Academy works directly with 77 schools across Queensland and hosts approximately 190 events annually.



## Improving availability and access to education

To ensure quality education outcomes for students and industry, resources-related courses must continue to be broadly available, from apprenticeships to postdoctoral degrees. Courses in key resources-related studies, such as mining engineering and geology, support the growth and productivity of the sector. Government and industry are working together to fund courses and incentivise students to study these disciplines so that enrolments increase and courses continue to be offered in Australia.

Resource-related courses and training should also be readily available to students in resources-rich regions. This will support residents to live and work in their communities while also providing a local workforce pipeline for the industry. To assist students, institutions have embraced remote or e-learning models to allow more students access to education, especially during the COVID-19 pandemic.

The Government and industry offer a range of support and scholarships, while Government also provides funding to support universities and training institutions. Government support and incentives for students are improving the accessibility of resources-related education and training.

- The Job-ready Graduates Package announced in 2020 will reduce student contributions for undergraduate courses in key growth areas relevant to resources careers.
- \$400 million was announced in June 2020 to increase opportunities for regional and remote students to attend university, and to lift investment in regional university campuses.
- The \$1 billion JobTrainer Fund will provide up to 340,700 additional training places that are free or low fee, in areas of identified skills need for job seekers and young people, including school leavers.
- The Government is also helping to establish a new School of Mining and Manufacturing in Central Queensland (see case study) to support students in regional areas.

Finally, the Government and industry are working together to understand supply and demand factors affecting the future workforce pipeline. The Australasian Institute of Mining and Metallurgy will work with Victoria to understand factors influencing youth decision-making regarding pursuing careers in the resources sector. By understanding and addressing these factors, industry, Government and educators can inform programs aimed at attracting young people into the sector and promote greater participation.

## More training and education in resource-rich regions

Mining is one of Australia's largest industries in many regional areas. In Queensland, mining employs over 65,000 people and makes up 13.8 per cent of the State's GDP.

The Australian Government is contributing \$30 million to establish the *Central Queensland University School of Mining and Manufacturing*, with new infrastructure being built for the School of Manufacturing in Gladstone and the School of Mining in Rockhampton. The mining sector employs 9,700 people in the Fitzroy region, with more projects expected to create additional jobs in coming years.

The new schools will provide this mining-rich region with access to new facilities and support skills-training, education, research and workforce development needs in demand by local employers. The courses will support the growing needs and change within industry and introducing emerging technology with specialised skills needed to ensure the students and future employees of central Queensland are skilled and able to support the emerging jobs and industry needs. It will offer workers opportunities to upskill — looking at cutting-edge and emerging technologies and new research collaborations with the mining industry.





### Cutting-edge education and training outcomes

The resources sector relies on a combination of qualifications and skills, specialists and generalists. It is important that the education sector produces the right skills for a career in the resources sector, especially for more specialist occupations like mining engineering. Designing courses to produce accredited, appropriately-skilled graduates is integral to meeting industry workforce demand, boosting innovation and productivity, and maintaining safe mine sites.

The Government, industry, and the education sector are working together to keep education and training up to date. It is increasingly important as skillsets are changing. For example, future resources workers will include more data analysts, robotics engineers, and technology experts, as well as those with soft skills and social license components such as stakeholder management and cultural awareness.

Working with industry to keep courses cutting-edge improves outcomes for students and industry. Partnerships are critical to ensuring graduates leave the training system with skills and experience they need to succeed in the workforce. Government is working to boost partnerships through:

- \$585.3 million Delivering Skills for Today and Tomorrow package, including to enhance the role and leadership of industry in the design and delivery of VET training programs.
- Mining Skills Organisation Pilot being trialled in partnership with the Minerals Council of Australia to provide industry with opportunities to shape the training system to respond to skills needs and trial innovative training solutions.
- \$40 million Strategic University Reform Fund that will enhance collaboration between universities and local employers.
- \$900 million National Priorities and Industry Linkage Fund that will encourage universities and industry partnerships to increase and develop innovative, practical courses that improve the learning experiences for students.



## Continuous professional development: upskilling, reskilling and cross-skilling

As skills needs continue to change and evolve, embracing a culture of continuous learning is critical for workers and business alike. A flexible, responsive education system that enables cross-skilling, upskilling and reskilling will help facilitate this continuous learning culture, as well as ensure that workers are well-positioned now and into the future.

Government and industry recognise the importance of upskilling and reskilling workers to quickly adapt and respond to changing skills needs. Short courses, including microcredentials, present a valuable means to respond to this training need. Microcredentials are increasingly being used by workers and industry to build upon existing knowledge and to learn new targeted competencies to complement their current skillset.

The Government has committed \$4.3 million over three years to build a national online microcredentials marketplace. The marketplace aims to strengthen credit recognition, industry relevance of qualifications, and provides an opportunity for industry, workers and students to have more choice in how they access training for the skills they need. The marketplace will provide current and prospective resources employees with a platform that will assist them to understand the courses available. This will further enable upskilling that can further a career, or reskilling to help people transfer into the sector.

The JobTrainer Fund is also helping to expand access to micro-credentials. Under the JobTrainer Fund, a mix of short courses and full qualifications are being offered to provide flexibility to those

that are looking to undertake some training before re-entering the workforce. Short courses will also enable young people to gain initial skills or try training in an area of interest.

These measures will support workers to cross-skill — learning common cross-disciplinary skillsets that enable easier transitions between sectors and different resources projects. Having a core foundation in STEM that is common across a range of industries improves employability and maximises career opportunities. Industry and education are also recognising the need for cross-skilling. Cross-disciplinary and double degree courses such as the University of Adelaide's Bachelor of Engineering (Mining) and Bachelor of Mathematics and Computer Science enable students to specialise in more than one chosen field. This develops transferable skills and knowledge across sectors while meeting the resources sectors demand for more technology-literate mining engineers.

Furthermore, cross-skilling promotes movement within the resources sector, which helps workers to retain employment across the project life-cycle (that is — from exploration to construction to operations to rehabilitation), while projects are in care and maintenance, or as the sector continues to grow into new and emerging commodity markets.



# Pathways for a Strong Future

## Connecting Australians, education and industry

The National Skills Commission was recently established to identify current and emerging skills needs and is developing 'nowcasting' capability to understand the state of the labour market in almost real-time. This includes the use of data from the Jobs and Education Data Infrastructure project to develop and publish new insights to help individuals, businesses, education providers and policy makers adapt to the changing labour market.

The National Careers Institute uses real-time information on job vacancies, labour forecasts and skills demand to provide career information and support, and identify training options in searched locations to assist Australians to find training and courses in their area and as new courses become available.

The Government is investing \$50.6 million to establish Industry Training Hubs across Australia. Training Hubs aim to improve opportunities for young people in regions with high youth unemployment, targeting Year 11 and Year 12 students. Each Training Hub will be managed by a full-time Career Facilitator that will work with and encourage young people to build skills and choose occupations that are in demand in their community. This will create better linkages between schools and local industry, repositioning vocational education and training as a first-choice option. Through this work, the Industry Training Hubs will also help eliminate persistent high youth unemployment in regional areas and maximise post-COVID-19 job recovery.

In addition to the Industry Training Hubs, the Commonwealth Scholarships Program for Young Australians will provide around 400 scholarships for young Australians to participate in vocational education and training with strong pathways to jobs in areas of skills needs in the same ten regions across Australia.

METS Ignited, an Australian Government industry growth centre, established the METS Career Pathway Program to link students with METS industries. The program is designed to boost student and teacher awareness of the sector through paid vacation internships. The program focuses on improving students' understanding of the job skills required and opportunities available in the METS sector and expects to see 50-100 graduates entering the METS sector every year.

## Investing in the future

Australia's resources sector is an economic powerhouse that safeguards our economic prosperity and employs many Australians. The sector plays an important role in supporting a strong post pandemic recovery both through its robust workforce and economic benefits to the nation. Continued growth, productivity and economic performance relies on an abundant, talented and future ready workforce. Attracting, supporting and retaining people with the right skillsets will ensure that the sector continues to deliver economic benefits to all Australians.

The Government recognises the strong need for a combined holistic approach to address the key challenges and fully harness the opportunities to build a strong and talented resources workforce and is committed to continue working with industry, education and state and territory governments. Working together, we will ensure that as many Australians as possible take up these jobs and that the Australian resources sector and its workforce remains world-leading through embracing opportunities, boosting participation and maintaining quality.



